SPECIAL PAMPHLET *No. 56*

PASTURE IMPROVEMENT FOR CHEAPER PRODUCTION
(PRAIRIE PROVINCES)

War-time economy of production of meats, milk, wool and other animal products depends largely upon the availability of sufficient high quality pasturage. It is essential that this pasturage be palatable, nutritious and productive, having a relatively high carrying capacity.

Many range areas and native farm pastures are in a badly depleted and weedy condition. This applies also to many of the cultivated pastures especially in the drier areas. While irrigated pastures are more productive, in many cases they have become weedy and their carrying capacity has been seriously lowered. The use of suitable pasture crops, together with correct management and the application of pasture improvement practices, would greatly increase productivity.

Improvement of Native Pastures

Native pastures may be improved by controlled grazing, reseeding, utilization of run-off water, and the application of fertilizers.

Proper pasture management is the principal means of improvement applicable to native pastures. Range areas and prairie farm pastures should not be over-stocked for long periods. They should be grazed slightly under their average carrying capacity over a number of years, particularly during the spring months. Fields that are to be grazed in the spring should have a good carry-over of grass from the previous year. During years of average rainfall, about half of the current year's growth should remain as carry-over for the following season. Part of the grass should be allowed to produce seed. Badly depleted pastures should be protected from grazing or grazed very lightly during the spring and summer months for several years in succession. The pasturage may be utilized during the fall and winter months. Proper distribution of watering places and salt licks will materially aid in securing uniformity of grazing.

Reseeding.—In the prairie areas artificial reseeding can usually be practised to advantage wherever the native grass has been almost entirely killed out. This applies particularly to untillable farm pastures and to certain areas on range lands and on lighter soil types. Crested wheat grass is well suited for this purpose on account of its drought tolerance and its ability to compete successfully with native grasses and weeds.

Where the soil is sandy and likely to drift, the grass seed should be drilled into the weed cover without previous cultivation. The seed should be sown

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through every other spout of the seeder at the rate of 5 pounds per acre and at a depth of ½- to ¾-inch. On heavier soils where the surface is hard or covered with club moss, double disking previous to seeding is recommended. On land too rough for a grain drill, the seed may be broadcast at 10 or 12 pounds per acre followed by a single disking or a stroke with a spike-tooth or brush harrow. Avoid broadcasting unless the seed can be worked into the surface soil.

In the more moist areas of the park belt and on grey wooded soils the acreage of native pasture is usually small. If these pastures become badly depleted through overgrazing, it is advisable to break them up and seed them to a suitable grass or mixture. This applies also to areas subject to flooding.

Utilization of Run-off Water.—In many native pastures there is considerable run-off in the spring from melting snow and also following heavy summer rains. Spreading this water over the pasture by the use of a few contour furrows or dykes is a practical means of increasing production. This practice is particularly applicable on large areas where the slope is not too steep. After gullies have formed, diversion dams must be built in order to use the water.

Regrassing Abandoned Farm Lands

Throughout the Prairie Provinces there are large areas of abandoned farm lands mostly covered with weeds of low forage value. Regrassing such areas greatly increases pasturage and hay production. Crested wheat grass is particularly well suited for this purpose, either alone or in mixture with a legume. The following mixtures are recommended: for the drier areas, 4 pounds of crested wheat grass and 2 pounds yellow sweet clover per acre; for areas having slightly better moisture conditions, 5 pounds of crested wheat grass and 2 pounds alfalfa. The seed should be drilled in among the weed cover through every other spout of the seeder and at a depth of ½- to ¾-inch.

Early in September is the best time to sow crested wheat grass, provided there are not many grasshoppers present at that time. Seeding may also be done just before freeze-up or very early in the spring. Early spring seedings usually prove best where sweet clover is the legume used in the mixture.

Recommended Treatment for Permanent Cultivated Pastures

The productivity of cultivated pastures may be maintained or increased by the use of suitable crops or mixtures, proper cultural practices, the use of fertilizers and proper management. For the poorer soils and drier areas of the prairies 5 or 6 pounds of crested wheat grass per acre, sown in rows spaced 1 foot apart is recommended. Where moisture conditions are slightly more favourable use 7 pounds per acre in rows 1 foot apart. In the more moist prairie areas (dark brown soil zone) crested wheat grass at 8 or 10 pounds per acre or brome grass at 12 pounds per acre may be sown in drills 6 inches apart. Wherever the water-table is high or the moisture supply fairly abundant, even if only on portions of the field, alfalfa at 2 or 3 pounds per acre may be added to advantage. Yellow sweet clover may replace alfalfa on permanent pastures.

Seed mixtures for the park belt and grey wooded soil areas will vary according to soil type, moisture conditions and length of time the pasture is to be left down. In the drier portions a mixture consisting of 9 to 12 pounds of crested wheat grass and 3 or 4 pounds alfalfa per acre is recommended. Under more favourable moisture conditions 10 to 16 pounds of brome grass and 3 to 5 pounds alfalfa proves satisfactory. In areas most favoured by moisture and especially where the pasture is to be left down for a number of years, such crops as Kentucky blue grass, timothy, red clover, alsike and white clover may be included in the mixtures. A recommended mixture consists of 8 pounds of brome grass, 4 pounds alfalfa, 4 pounds Kentucky blue grass and 2 pounds white Dutch clover. Under very moist conditions, timothy may be used instead of brome and red clover or alsike may take the place of alfalfa. On grey wooded and partially degraded soils the addition of legumes is important.

For non-alkaline low-lying areas which are not subject to flooding for more than two to three weeks a mixture of 12 to 14 pounds of brome with 1 to 2 pounds of alsike or 8 to 10 pounds of brome with 4 or 5 pounds of timothy and 1 to 2 pounds of alsike is recommended. For areas likely to flood for more than three weeks the following mixtures are suggested: 6 to 8 pounds of red top with 1 to 2 pounds of alsike; 5 to 6 pounds of reed canary grass with 1 or 2 pounds of alsike; or 3 to 4 pounds of each of red top and reed canary with 1 to 2 pounds of alsike. On areas that are somewhat alkaline, sweet clover and slender wheat grass usually prove satisfactory.

On spring flooded areas that receive an uncertain and sometimes scanty amount of run-off water, a mixture of 6 pounds crested wheat grass, 5 pounds brome grass and 4 pounds alfalfa is recommended. When a dependable supply of water is available and the pasture can be irrigated throughout the season, various mixtures may be used. If the pasture is to be broken up in 4 or 5 years a mixture of 12 to 14 pounds of brome and 4 or 5 pounds alfalfa proves satisfactory. Where the pasture is to be seeded down for a term of 6 years or more the following mixture is recommended: 7 pounds of brome, 3 pounds of alfalfa, 6 pounds of Kentucky blue grass, and 2 pounds of white Dutch clover or wild white clover.

Land Preparation.—Proper preparation of the land previous to seeding is important since it affects production for a number of years. Land must be firm in order to avoid over-deep seeding, and should be protected against soil drifting. For fall seedings it is also important to have a stubble, trash or weed covering. Clean summer-fallow having a reserve of moisture is ideal provided the above factors are taken care of. On the prairies and drier areas of the park belt it is advisable to seed directly into the grain stubble with no previous cultivation to avoid soil drifting. In the more moist areas the seeding may be done on well packed fall or spring ploughing. On newly broken land it is advisable to grow grain crops for a year or two before seeding down. In irrigated areas the land should be well levelled and the necessary dykes and ditches constructed before seeding. This is important since pastures require frequent irrigation.

Time of Seeding.—Time of seeding should be regulated so that moisture will be available close to the soil surface for a considerable time. In the drier areas this condition is most generally provided in the fall or early spring. Grasses may be seeded into the stubble or weed cover in late August or early September provided there is sufficient moisture to promote growth and grasshoppers are not too prevalent. Just before freeze-up is also a good time for seeding grasses. Where legumes are being sown, early spring planting is advisable, although in the case of alfalfa, seeding just before freeze-up usually proves satisfactory. In moist areas and on irrigated land it is advisable to sow grasses in the early fall; late fall and spring seeding is also satisfactory. Where legumes are included in the mixtures seeding should be done in the spring. Avoid fall seeding on bare ground such as summer-fallow or fall ploughing.

Depth of Seeding.—The grasses and legumes recommended for permanent pastures should be seeded at a depth of not over one inch and preferably less. The seed, however, should be placed in the soil and not left on the surface. This is especially important in the drier areas.

Method of Seeding.—On the prairies and on the drier areas elsewhere a nurse crop should not be used. In moist areas and on irrigated land nurse crops should not be used unless required for the prevention of soil drifting or water erosion. When a nurse crop is used, wheat is preferred to oats or barley and it should be seeded at about half the regular rate. Wherever possible the seed should be sown through a grain drill. Several grasses and mixtures can be sown directly from the grain box without being mixed with other material. However, a grass seeder attachment is often helpful. Broadcasting has not proved satisfactory in the drier areas, but under favourable moisture conditions it usually gives good results. When broadcast, the seed should be sown at slightly heavier rates and the land should be lightly disked or harrowed after seeding.

Manure and Commercial Fertilizer for Pastures

The productivity of native or cultivated pastures may be increased by the application of barnyard manure. This is particularly true in the more moist areas, on grey wooded soils and on irrigated land. The recommended application consists of 10 to 12 tons per acre. The manure may be spread in the fall or during the winter and preferably with a manure spreader as a uniform application is necessary. It is advisable to harrow the manured area just as the frost is going out in the spring to break up the lumps and pulverize the manure as much as possible. Manure voided by the animals on the pasture also should be scattered by harrowing. Before seeding cultivated grasses on grey wooded soils the practice of working manure into the land before seeding is strongly recommended. This practice can also be followed to advantage on irrigated land and in the more moist park belt areas.

Little information is available respecting the use of commercial fertilizer on pastures in the Prairie Provinces. Its use on pastures except on grey wood soils and possibly on irrigated land is not advised. An application of from 40 to 60 pounds per acre of ammonium sulphate or ammonium phosphate 16-20-0 results in a marked increase of yield on grey wooded soils. The cost of the fertilizer in relation to the value of the increased yield must be considered.

Before applying commercial fertilizers to pastures full information should be obtained from the nearest Experimental Station or other authority.

Management of Cultivated Pastures

Stock should be turned on the pasture as early in the spring as condition of the land and growth of grass will permit. Excessive trampling while the land is soft and the grass short results in severe damage to the vegetative cover. The pasturage should not become too mature before grazing starts as the plants tend to become less palatable and much good grazing is lost. The principal grasses should be about 4 inches in height when grazing starts. Pastures that are to be used in the early spring should not be closely grazed during the previous fall; there should be some old grasses among the new. Close grazing over a long period of time results in general deterioration of the pasture.

Weeds may be controlled to some extent by mowing before they go to seed. Patches of ground that are bare or covered with weeds should be reseeded at a time when conditions for growth are favourable. Such practices tend to maintain the pasturage in a highly productive condition. If, however, the pasture becomes badly depleted and weedy it should be ploughed up and used for the production of grain or intertilled crops for at least two years.

Supplementary Pastures

Frequently the productivity of permanent pastures is insufficient to adequately feed the stock being carried without overgrazing. In such a case certain crops may be used to advantage to provide supplementary pasture. Oats and fall rye are frequently used for this purpose. In the dry prairie areas, rye sown in August at the rate of 1 to 1½ bushels per acre usually provides pasturage during the late fall and following spring. In more moist areas oats sown at slightly higher than usual rates provide good pasturage. A mixture of 1½ to 2 bushels of oats with 1 bushel of fall rye per acre, seeded in the early spring, yields well throughout the growing season. Other crops which may be utilized in a similar way include wheat, spring rye, barley, and sweet clover.

Rape seeded at 3 to 5 pounds per acre in intertilled rows makes an excellent fall pasture, especially for sheep and hogs. In areas not subject to late spring or early fall frosts corn may be grown and pastured in late summer or fall.

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